

## REMARKS

Claims 1, 2, 4, 6-13, 15, 16, 18, 20, 22 and 23-24 are pending. New claim 24 has been added and is directed to a cylinder head formed of a specifically claimed alloy. Support for new claim 24 can be found throughout the specification and claims as originally filed, for example, on page 4, line 26 of the specification. The remaining claims remain unchanged. No new matter has been entered. Entry of the amendment and favorable reconsideration are earnestly solicited.

Claims 1-2, 4, 6-13, 15, 16, 18, 20, 22 and 23 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over SU 348633A(SU'633) or over Dulin (US 2,821,495a). Applicant respectfully requests reconsideration and withdrawal of these rejections.

First of all, the Examiner apparently believes that a *prima facie* case of obviousness has been shown with regard to the instant claims viz SU '633 or Dulin. Applicants respectfully disagree. That is, SU '633 simply does not teach or suggest a cast part formed of an alloy where no vanadium has been added<sup>1</sup>. Dulin simply does not teach or suggest a cast part with the specific claimed amount of Zr. This is a fundamental point of law wherein there is a disagreement between Applicants and the Examiner. The declaration of Mr. Garat submitted on February 23, 2009 must be given weight in determining whether a *prima facie* case even exists in the first place. The Garat Declaration has clearly shown that there has not been. The Examiner misses the point when stating on page 6, ¶8 of the Action that, "declarant has not shown unexpected results with respect to the specific applied art of SU' 633 or Dulin." Indeed, this declaration of Mr. Garat does indeed show that there is no *prima facie* case in the first instance under the law set forth by the Federal Circuit in *KSR*. (See Garat Feb. '09 Declaration; ¶¶ 5-9, and 12).

To further show the lack of a *prima facie* case, a side by side comparison of the claims and SU'633 and Dulin is set forth below.

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<sup>1</sup> Applicants also point out the separate patentability of new claim 24 which relates to a cylinder head. A sand cast and wrought structural components (as in Dulin) or a casting for a heavy duty machinery body castings (as in SU'633) are not cylinder heads are now recited in new claim 24.

	Invention	US Dulin	SU'633
	<b>Cast parts (i.e. cylinder head)</b>	Brazed assembly of sand cast & wrought structural components	Heavy duty machinery body castings
<b>Si</b>	5 - 11	5 - 10	6 - 8
<b>Fe</b>	< 0.3		
<b>Mg</b>	0.25 - 0.5	0.25 - 0.6	0.5 - 0.9
<b>Cu</b>	0.3 - 1.5	0.1 - 1.5	0.3 - 0.7
<b>Ti</b>	0.05 - 0.25	Opt.0.1 - 1.0	0.1 - 0.2
<b>Zr</b>	0.05 - 0.25	Opt.0.1 - 1.0	0.05 - 0.2
<b>Mn</b>	< 0.4	Opt.0.1 - 1.0	0.1 - 0.2
<b>Zn</b>	< 0.3		
<b>Ni</b>	< 0.4	Opt.0.1 - 1.0	
<b>Cr</b>	< 0.1	Opt.0.1 - 1.0	
<b>B</b>	< 0.1	Opt.0.1 - 1.0	0.01 - 0.05
<b>Be</b>	< 0.1	Opt.0.1 - 1.0	0.005 - 0.01
<b>Misch.</b>	< 0.1		0.1 - 0.2
<b>Other</b>	< 0.1 each. < 0.3 tot.		V : 0.1 - 0.3

As such, as proven by Mr. Garat's opinion as one of skill in the art and the above chart, there would have been no motivation to have selected the claimed range of Zr from the disclosure of Dulin nor to have included an alloy with no added V from the disclosure of SU'633. .

Furthermore, again Applicants must disagree with the Examiner also with respect to the specific statement alleged, that "declarant has not shown unexpected results with respect to the specific applied art of SU' 633 or Dulin." This is not true. To wit, Mr. Garat, in his Feb. '09 Declaration states that following,

"I confirm that as one of skill in the art, it is my opinion that the unexpected results detailed in the tested examples described in the prior declaration to be relevant across the entire scope of the claimed alloying range; that is, for Si 5-11, Fe at most up to 0.3, Mg 0.25-0.5, Cu 0.3-1.5, Ti 0.05-0.25, Zr 0.05-0.25, Mn <0.4, Zn <0.3, Ni <0.4, other <0.10 each, <0.30 total, remainder aluminum. I have this opinion because the Zirconium addition of from 0.05-0.25% improves the creep resistance by forming very fine AlZr(Ti)Si phases (of the order of 0.3  $\mu$ m) during the solution treatment generally at between 500 and 540°C. It is my experience that only the Si in solid solution in the aluminum dendrites (about 1.5% independently from the total amount of 5 to 11%) can combine with Zr and Al to form these phases and the silicon in excess (5 to 11% minus 1.5%) is in the form of comparatively coarse eutectic crystals (about 10  $\mu$ m) which do not interact with Zr. The other elements Fe, Cu, Mg, Zn, Ni, Mn do not play any part in the AlZr(Ti)Si phases and therefore, the recited ranges would be expected to also display the unexpected results across those ranges recited in claim 1. Ti partly combines with Al, Zr and Si, and is favorable to creep resistance and the range of 0.05-0.25% Ti is what would be expected to work best in this case. "

As such, since there have been unexpected results shown, and those results are commensurate in scope with the present claims and display criticality, even if there were a *prima facie* case of obviousness, such a point would be moot in view of the unexpected results already of record in this matter.

For all these reasons, it is respectfully submitted that the instant rejections are improper and should be withdrawn. The Examiner is respectfully requested to reconsider and withdraw the outstanding rejections based on SU '633 and Dulin.

### **CONCLUSION**

In view of the foregoing remarks, Applicant respectfully asserts that the rejections as set forth in the Office Action of March 24, 2009 have been addressed and overcome. Applicant further respectfully asserts that all claims are in condition for allowance and requests that a Notice of Allowance be issued. If issues may be resolved through Examiner's Amendment, or clarified in any manner, a call to the undersigned attorney at (202) 508-3450 is courteously solicited.

The Commissioner is hereby authorized to charge deposit account 50-4254 for any deficiency of fees or credit any overpayments.

Respectfully submitted,

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